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The Taxonomy of the Harpacticoid Copepods of the Northern Gulf of Mexico: a Taxon of Potential Importance to the Navy

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LONG-TERM GOALS

There is a crisis in taxonomy. The professionals who could identify species and describe new taxa are retiring, and their jobs are being eliminated or shifted to other disciplines. If the infrastructure of ecology, in particular, and biology generally is to be maintained, ways must be found to train new workers in taxonomy that simultaneously make them employable. It is my long-term goal to contribute to the solution of this problem.

OBJECTIVES

I believe that this goal can be achieved by training graduate students in oceanography to do the taxonomy of the groups they study, thus passing taxonomic skills to a new generation. A doctoral student, Lori Bouck, is being trained in this way in my laboratory.

APPROACH

The Navy has had a long-term presence in harbors and the estuaries in which they are situated. The environmental consequences of this presence are of concern. To determine whether impact has occurred (or whether recovery from an impact is complete) will require comparison of faunas from affected and control sites, which will depend on an infrastructure of scientific names. Because not all organisms can be studied, target groups must be used for such comparisons. Because of their ubiquity and abundance, harpacticoid copepods (Crustacea) are particularly appropriate for this purpose. Therefore, the taxonomic education of the student mentioned above is focused on the harpacticoid copepod fauna of estuaries.

The student and I are studying harpacticoids from subtidal, estuarine sediments from the northern Gulf of Mexico. For abundant species that appear to be new to science, we first assemble the relevant taxonomic literature to confirm that the species have not been previously been described. We then dissect, mount, and illustrate specimens to provide the information needed to describe the species

formally. We supplement this light-microscope work with parallel investigations using the scanning electron microscope.

Because this grant is for training, the student and I have also been studying treatises on modern taxonomic methods and have been consulting with other harpacticoid taxonomists about techniques.

WORK COMPLETED

During FY00, we completed the work on *Zausodes* and began a study of *Protopsammotopa*. We discovered two new species, completed the dissections, and made considerable progress in the preparation of the taxonomic illustrations. I anticipate that this project will be completed within the next six months.

RESULTS

As anticipated when this project was proposed, the student has reached a level of expertise that will allow her to publish professional-quality taxonomic research. She also has the ability to distinguish species correctly, which will be valuable in her ecological studies. She has presented her work at scientific meetings and is publishing.

IMPACT

See OBJECTIVES.

TRANSITIONS

Our discovery that computer-aided drawing can be used for taxonomic illustrations is changing the way such illustrations are made. The student and I have presented two posters on our procedures at scientific meetings. Several professional taxonomists have expressed interest in learning our methods. Since the paper describing our methods has appeared, we have received many requests for copies. In addition, the taxonomic paper on *Zausodes* has been requested by several professionals.

RELATED PROJECTS

None.

PUBLICATIONS

Bouck, L., D. Thistle, and R. Huys. 1999. Systematics and phylogeny of *Zausodes* C. B. Wilson (Copepoda, Harpacticoida, Harpacticidae) including three new species from the northern Gulf of Mexico. *Bulletin of the Natural History Museum London (Zool.)* 65, 73-122.

Bouck, L., and D. Thistle. 1999. A computer-assisted method for producing illustrations for taxonomic descriptions. *Vie et Milieu* 49, 101-105.